

A CATALOG OF QUADRI / TRIVALENT GRAPHS

BY

N. S. Sridharan

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N. S. Sridharan
Heuristic Programming Project

ABSTRACT: In a previous report [1] a method for computer **generation** of **quadri/trivalent** "vertex-graphs" was presented in detail. This report is a catalog of 13 classes of graphs generated by using this method.

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INTRODUCTION

A "vertex-graph" is a graph satisfying the following constraints:

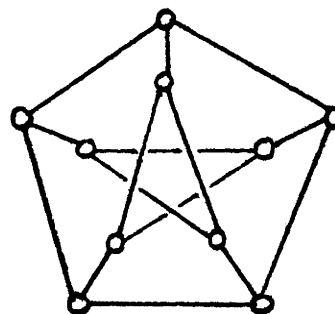
- i) Its vertices are of valence 3 or higher;
- ii) It is at least **2-edge-connected**, i.e., no bridges;
- iii) Its vertices have no self-loops.

The above definition permits multiple edges between vertices, i.e., multi-graphs.

A previous paper indicated the need for the availability of a complete list of vertex-graphs for specified degree sequences and the usefulness of such a list to a computer program [2] that generates a complete list of isomers based on a specified atomic composition. Chemical atoms of valence higher than 4 are rare and thus our attention here is confined to vertex-graphs $G(t,q)$ having t vertices of valence 3 and q vertices of valence 4.

The computer method presented in [1] uses the sub-methods of "Edge Labelling" and "Vertex-Pair Promotion", and generates $G(t,q)$ graphs from $G(t+2q)$ graphs, i.e., from Trivalent Regular Graphs.

Lederberg [3] has presented a listing of $G(t,0)$ graphs which was used in generating the graphs presented at the end of this report. Lederberg's lists are complete for $t=2,4,6$ and 8. For $t=10$ the only (non-Hamiltonian, non-planar) graph that was not listed was the Petersen graph shown below.



RESULTS

Table 1 shows the number of $G(t,0)$ graphs. Table 2 lists the number of quadri/trivalent graphs that were derived. The Appendix gives a complete list of graphs.

REFERENCES

1. N. S. Sridharan, "Computer Generation of Vertex-Graphs", Stanford Computer Science Memo STAN-CS-73-381, Stanford University; California, July, 1973.
2. H. Brown and L. Masinter, "An Algorithm for the Construction of the Graphs of Organic Molecules", to appear in DISCRETE MATHEMATICS, 1974.
3. J. Lederberg, "DENDRAL-64" Part II. Topology of Cyclic Graphs, NASA Technical Report CR 68898, 1965.

TRIVALENTS

NUMBER OF GRAPHS

2	1
4	2
6	5
8	16
10	66

Table I. Number of $G(t,o)$ graphs.

<u>GRAPHS</u> <u>TRIVALENTS</u>	HAVING <u>QUADRIVALENTS</u>	<u>COUNT</u>	<u>TRIVALENTS IN</u> <u>BASIS GRAPH</u>
2	1	1	4
4	1	5	6
6	1	24	8
8	1	180	10
2	2	4	6
4	2	34	8
6	2	297	10
0	3	1	6
2	3	12	8
4	3	186	10
0	4	3	8
2	4	54	10
0	5	6	10

Table II. SUMMARY OF RESULTS PRESENTED

Explanation of Format:

Disclaimer:

<u>Graphs List</u>		begins on										<u>Page</u>
<u>t</u>	<u>q</u>											
2	1			.	.	.		.	.	.	.	
4	1	.	.	.		.	.	.	.	.	.	
6	1	.	.		.	.	.		.	.	.	
8	1	.	.	.	.			.	.	.		
2	2	.			.	.	.		.	.	.	
4	2	.	.	.		.		.	.		.	
6	2		.		.	.	.	.		.		
0	3	.	.	.		.	.		.	.	.	
2	3		.	.	.	.		.	.	.	.	
4	3	.	.	.	.		.	.	.		.	
0	4	.		.	.	.		.	.	.		
-2	4	.	.	.		.		.	.		.	
0	5		.	.	.			.	.		.	

CATALOG21 (1 Entry)

1-2 1-2 1-3 1-3 2-3

CATALOG41 (5 Entries)

1							
1-2	1-3	1-4	1-5	2-3	2-5	3-4	4-5
2							
1-2	1-2	1-3	2-4	2-5	3-4	3-5	4-5
3							
1-2	1-3	1-4	1-5	2-3	2-3	4-5	4-5
4							
1-2	1-2	1-3	1-3	2-4	3-5	4-5	4-5
5							
1-2	1-2	1-3	2-3	2-4	3-5	4-5	4-5

.

CATALOG61 (24 Entries)

1	1-2	1-2	1-7	1-7	2-3	3-4	3-4	4-5	5-6	5-6	6-7
2	1-2	1-2	1-7	2-3	3-4	3-4	3-5	4-7	5-6	5-6	6-7
3	1-2	1-2	1-5	1-7	2-3	3-4	3-4	4-5	5-6	6-7	6-7
4	1-2	1-2	1-5	2-3	3-4	3-4	4-5	5-6	5-7	6-7	6-7
5	2-2	1-2	1-7	2-3	2-3	3-f	4-5	4-j	5-6	5-6	6-7
6	1-2	1-2	1-7	2-3	3-4	3-4	4-b	5-6	5-6	5-7	6-7
7	1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-7	5-6	5-6	6-7
8	1-2	1-2	1-7	2-3	3-4	3-7	4-5	4-5	4-6	5-6	6-7
9	t-2	1-2	1-7	2-3	3-4	S-6	4-5	4-7	5-6	5-6	6-7
10	1-2	1-2	1-7	2-3	2-4	3-4	3-7	4-5	5-6	5-6	6-7
11	1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-7	5-6	6-7	6-7
12	1-2	1-2	1-7	2-3	3-4	3-4	3-6	4-3	5-6	5-7	6-7
13	1-2	1-2	1-6	1-7	2-3	3-4	3-4	4-5	5-6	5-7	6-7
14	1-2	1-2	1-7	2-3	2-3	3-4	4-5	4-5	5-6	5-7	6-7
15	1-2	1-3	1-6	1-7	2-3	2-5	3-4	4-5	4-7	5-6	6-7
16	1-2	1-3	1-7	2-3	2-4	2-5	3-4	4-6	5-6	5-7	6-7
17	1-2	1-3	1-7	2-3	2-4	3-4	4-5	4-6	5-6	5-7	6-7
18	1-2	1-2	1-3	1-7	2-3	3-4	4-5	4-c)	5-6	5-7	6-7
19	2-2	1-2	1-3	2-3	3-4	3-7	4-5	4-b	5-6	5-7	6-7
20	1-2	1-2	1-7	2-3	3-4	3-5	3-7	4-5	4-6	5-6	6-7
21	222	12 .	17 .	23 .	3a4	3-5	3a6	4m3	4a7	5-6	6-7
22	1-2	1-2	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	6-7
23	1-2	1-2	1-4	1-7	2-3	3-4	3-6	4-5	5-6	5-7	6-7
a4											

1-2 1-2 1-7 2-3 2-4 3-4 3-6 4-5 5-6 5-7 6-7

CATALOG81 (180 Entries)

1													
1-2	1-3	1-9	2-3	2-5	3-4	4-5	4-6	4-7	5-6	6-8	7-a	7-9	8-9
2													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	4-6	5-6	5-8	6-7	7-8	7-9	8-9
3													
1-2	1-3	1-9	2-3	2-4	2-5	3-4	4-6	5-6	5-8	6-7	7-8	7-9	8-9
4													
1-2	1-3	1-8	1-9	2-3	2-5	3-4	4-5	4-7	5-6	6-7	6-9	7-8	8-9
5													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	4-7	5-6	5-9	6-7	6-8	7-8	8-9
6													
1-2	1-3	1-9	2-3	2-5	3-4	4-5	4-7	5-6	5-9	6-7	6-8	7-8	8-9
7													
1-2	1-3	1-9	2-3	2-4	3-4	3-7	4-5	5-6	5-9	6-7	6-8	7-8	8-9
8													
1-2	1-3	1-6	1-9	2-3	2-5	3-4	4-5	4-8	5-6	6-7	7-8	7-9	8-9
9													
1-2	1-3	1-8	1-9	2-3	2-6	3-4	4-5	4-9	5-6	5-7	6-7	7-8	8-9
10													
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11													
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12													
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13													
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14													
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15													
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16													
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17													
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18													
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24													

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50													

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66													
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68													
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69													
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70													
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71													
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72													
1-2	1-2	1-9	2-3	2-4	3-4	3-8	4-5	5-6	5-9	6-7	6-7	7-8	8-9
73													
1-2	1-2	1-6	1-9	2-3	3-4	3-5	4-5	4-9	5-6	6-7	7-a	7-8	8-9
74													
1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-0	7-8	7-9	8-9
75													
1-2	1-2	1-9	2-3	2-4	3-4	3-9	4-5	5-6	5-7	6-7	6-8	7-8	8-9
76													

1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	5-7	6-7	6-8	7-8	8-9
77													
1-2	1-2	1-4	1-9	2-3	3-4	3-5	4-5	5-6	6-7	6-8	7-a	7-9	8-9
78													
1-2	1-2	1-4	1-9	2-3	3-4	3-5	4-5	5-6	6-7	6-9	7-8	7-8	8-9
79													
1-2	1-2	1-9	2-3	2-4	3-4	3-9	4-5	5-6	5-8	6-7	6-7	7-8	8-9
80													
1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-9	7-8	7-8	8-9
81													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	5-8	6-7	6-7	7-8	8-9
82													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-7	6-8	7-8	8-9
83													
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84													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-9	5-6	6-7	6-8	7-8	7-8	a-9
85													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-5	5-6	6-7	6-9	7-8	7-8	8-9
86													
1-2	1-2	1-9	2-3	3-4	3-5	3-6	4-5	4-5	6-7	6-9	7-a	7-8	8-9
87													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-5	5-6	6-7	6-9	7-8	7-a	8-9
88													
1-2	1-2	1-9	2-3	3-4	3-4	3-5	4-5	5-6	6-7	6-9	7-8	7-8	8-9
89													
1-2	1-2	1-7	1-9	2-3	3-4	3-6	4-5	4-5	5-6	6-7	7-8	8-9	8-9
90													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-a	4-9	5-6	5-8	6-7	7-a	7-9
91													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-8	5-6	5-7	5-8	6-7	7-9	8-9
92													
1-2	1-2	1-9	2-3	3-4	3-5	3-8	4-5	4-7	5-6	6-7	6-9	7-8	8-9
93													
1-2	1-2	3-7	1-9	2-3	3-4	3-6	4-5	4-9	5-6	5-a	6-7	7-8	8-9
94													
1-2	1-2	1-4	1-9	2-3	3-4	3-6	4-5	5-6	5-8	6-7	7-8	7-9	8-9
95													
1-2	1-2	1-9	2-3	2-5	3-4	3-9	4-5	4-7	5-6	6-7	6-8	7-8	8-9
96													
1-2	1-2	1-9	2-3	3-4	3-5	3-9	4-5	4-7	5-6	6-7	6-8	7-8	8-9
97													
1-2	1-2	1-5	2-3	3-4	3-5	3-6	4-5	4-9	5-7	6-7	6-8	7-8	8-9
98													
1-2	1-2	1-4	2-3	3-4	3-6	4-5	4-9	5-6	5-8	6-7	7-8	7-9	8-9
99													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-9	5-6	5-7	5-8	6-7	7-8	8-9
100													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-9	5-6	5-7	6-7	6-8	7-8	8-9
101													
1-2	1-2	1-9	2-3	3-4	3-5	3-6	4-5	4-9	5-8	6-7	6-7	7-8	a-9
102													

1-2	1-2	1-4	1-9	2-3	3-4	3-6	4-5	5-6	5-9	6-7	7-8	7-8	8-9
103													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-5	5-6	5-9	6-7	7-8	7-8	8-9
104													
105	1-2	1-9	2-3	3-4	3-6	3-7	4-5	4-5	5-6	6-9	7-8	7-8	8-9
1-2	1-2	1-9	2-3	3-4	3-4	3-6	4-5	5-6	5-9	6-7	7-8	7-8	8-9
106													
1-2	1-2	1-6	1-9	2-3	3-4	3-7	4-5	4-5	5-6	6-7	7-8	8-9	8-9
107													
1-2	1-2	1-9	2-3	3-4	3-6	3-7	4-5	4-6	5-6	5-9	7-8	7-8	8-9
108													
1-2	1-2	1-9	2-3	2-6	3-4	3-5	4-5	4-9	5-6	6-7	7-8	7-8	8-9
109													
1-2	1-2	1-5	1-9	2-3	3-4	3-7	4-5	4-6	5-6	6-7	7-8	8-9	8-9
110													
1-2	1-2	1-5	1-9	2-3	3-4	3-8	4-5	4-6	5-6	6-7	7-8	7-9	8-9
111													
1-2	1-2	1-9	2-3	3-4	3-8	4-5	4-6	4-9	5-6	5-7	6-7	7-8	8-9
112													
113	1-2	1-9	2-3	3-4	3-6	3-8	4-5	4-9	5-6	5-7	6-7	7-8	8-9
1-2	1-2	1-5	1-9	2-3	3-4	3-9	4-5	4-7	5-6	6-7	6-8	7-8	8-9
114													
1-2	1-2	1-9	2-3	3-4	3-8	4-5	4-7	4-9	5-6	5-6	6-7	7-8	8-9
115													
1-2	1-2	1-5	2-3	3-4	3-9	4-5	4-8	5-6	5-9	6-7	6-7	7-8	8-9
116													
1-2	1-2	1-9	2-3	2-8	3-4	3-7	4-5	4-9	5-6	5-6	6-7	7-8	8-9
117													
1-2	1-2	1-5	1-9	2-3	3-4	3-9	4-5	4-8	5-6	6-7	6-7	7-8	8-9
118													
1-2	1-2	1-4	1-9	2-3	3-4	3-9	4-5	5-6	5-7	6-7	6-8	7-8	8-9
119													
120	1-2	1-3	2-3	3-4	3-9	4-5	4-6	5-6	5-8	6-7	7-8	7-9	8-9
121	1-2	1-9	2-3	3-4	3-9	4-5	4-6	5-6	5-7	5-8	6-7	7-8	8-9
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-6	5-6	5-8	6-7	7-8	7-9	8-9
122													
122	1-2	1-9	2-3	3-4	3-9	4-5	4-6	4-8	5-6	5-7	6-7	7-8	8-9
1-2	1-2	1-9	2-3	3-4	3-9	4-5	4-6	4-7	5-6	5-8	6-7	7-8	8-9
124													
125	1-2	1-3	2-3	3-4	3-9	4-5	4-7	5-6	5-9	6-7	6-8	7-8	8-9
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-7	5-6	5-9	6-7	6-8	7-8	8-9
126													
127	1-2	1-9	2-3	3-4	3-9	4-5	4-7	5-6	5-6	5-8	6-7	7-8	8-9
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-8	5-6	5-9	6-7	6-7	7-8	8-9
128													

1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-8	5-6	5-9	6-7	6-7	7-8	8-9
129													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-9	5-6	5-7	6-7	6-8	7-8	8-9
130													
1-2	1-2	1-9	2-3	3-4	3-9	4-5	4-8	4-9	5-6	5-7	6-7	6-8	7-8
131													
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-9	5-6	5-7	6-7	6-8	7-8	8-9
132													
1-2	1-2	1-9	2-3	3-4	3-9	4-5	4-8	4-9	5-6	5-8	6-7	6-7	7-8
133													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-9	5-6	5-8	6-7	6-7	7-8	8-9
134													
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-9	5-6	5-8	6-7	6-7	7-8	8-9
135													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	5-6	5-7	6-7	6-8	6-9	7-8	8-9
136													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	5-6	5-7	5-8	6-7	6-9	7-8	8-9
137													
1-2	1-3	1-9	2-3	2-4	3-4	4-5	5-6	5-7	5-9	6-7	6-8	7-8	8-9
138													
1-2	1-3	1-5	2-3	2-4	3-4	4-5	5-6	5-9	6-7	6-8	7-8	7-9	8-9
139													
1-2	1-7	1-7	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-6	6-7	8-9	8-9
140													
1-2	1-2	1-7	1-8	2-3	3-4	3-9	4-5	4-5	5-6	6-7	6-7	8-9	8-9
141													
1-2	1-7	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-6	6-7	6-7	8-9	8-9
142													
1-2	1-2	1-7	1-8	2-3	3-4	3-9	4-5	4-6	5-6	5-7	6-7	8-9	8-9
143													
1-2	1-7	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-6	5-7	6-7	8-9	8-9
144													
1-2	1-5	1-8	2-3	2-3	3-4	4-5	4-9	5-6	5-7	6-7	6-7	8-9	8-9
145													
1-2	1-2	1-7	1-8	2-3	3-4	3-9	4-5	4-7	5-6	5-6	6-7	8-9	8-9
146													
1-2	1-4	1-7	2-3	2-3	2-8	3-4	4-5	5-6	5-6	6-7	7-9	8-9	8-9
147													
1-2	1-7	1-8	2-3	2-7	3-4	3-4	4-5	4-9	5-6	5-6	6-7	8-9	8-9
148													
1-2	1-8	1-9	1-9	2-3	2-8	3-4	3-4	4-5	5-6	5-9	6-7	6-7	7-8
149													
1-2	1-2	1-9	2-3	2-3	3-4	4-5	4-7	5-6	5-8	6-7	6-9	7-8	8-9
150													
1-2	1-2	1-7	1-9	2-3	3-4	3-4	4-5	5-6	5-8	6-7	6-9	7-8	8-9
151													
1-2	1-2	1-9	2-3	3-4	3-5	4-5	4-7	4-8	5-6	6-7	6-8	7-9	8-9
152													
1-2	1-2	1-9	2-3	2-4	3-4	3-7	4-5	5-6	5-8	6-7	6-9	7-8	8-9
153													
1-2	1-2	1-7	1-9	2-3	3-4	3-5	4-5	4-8	5-6	6-7	6-9	7-8	8-9
154													

1-2	1-2	1-9	2-3	2-5	3-4	3-6	4-5	4-9	5-6	6-7	7-8	7-8	8-9
155													
1-2	1-2	1-5	1-9	2-3	3-4	3-6	4-5	4-7	5-6	6-7	7-8	8-9	8-9
156													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-7	4-8	5-6	5-8	6-7	7-9	8-9
157													
1-2	1-2	1-9	2-3	3-4	3-6	4-5	4-7	5-6	5-8	6-7	6-9	7-0	8-9
158													
1-2	1-2	1-9	2-3	3-4	3-5	3-7	4-5	4-8	5-6	6-7	6-9	7-8	8-9
359													
1-2	1-2	1-7	1-9	2-3	3-4	3-6	4-5	4-8	5-6	5-9	6-7	7-8	8-9
160													
1-2	1-2	a-9	2-3	2-5	3-4	3-7	4-5	4-9	5-6	6-7	6-8	7-8	8-9
161													
1-2	1-2	1-5	1-9	2-3	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-9	8-9
162													
1-2	1-2	1-5	1-9	2-3	3-4	3-6	4-5	4-9	5-6	6-7	7-8	7-8	8-9
163													
1-2	1-2	1-9	2-3	3-4	3-6	3-8	4-5	4-7	5-6	5-9	6-7	7-8	8-9
164													
1-2	1-2	1-6	1-9	2-3	3-4	3-7	4-5	4-9	5-6	5-8	6-7	7-8	8-9
165													
1w2	1w2	1-9	2-3	3-4	3-6	3-9	4-5	4-7	5-6	5-8	6-7	7-8	8-9
166													
1-2	1-2	1-4	1-9	2-3	3-4	3-7	4-5	5-6	5-8	6-7	6-9	7-8	8-9
167													
1-2	1-2	1-3	2-3	3-4	3-9	4-5	4-7	5-6	5-8	6-7	6-9	7-8	8-9
168													
1-2	1-2	1-3	1-9	2-3	3-4	4-5	4-7	5-6	5-8	6-7	6-9	7-8	8-9
169													
1-2	1-3	1-7	1-9	2-3	2-4	3-4	4-5	5-6	5-8	6-7	6-9	7-8	8-9
170													
1-2	1-3	1-9	2-3	2-5	3-4	4-5	4-7	4-8	5-6	6-7	6-8	7-9	8-9
171													
1-2	1-3	1-9	2-3	2-4	2-5	3-4	4-7	5-6	5-8	6-7	6-9	7-R	8-9
172													
1-2	1-3	1-7	1-9	2-3	2-5	3-4	4-5	4-8	5-6	6-7	6-9	7-8	8-9
173													
1-2	1-3	1-9	2-3	2-5	2-6	3-4	4-5	4-6	5-8	6-7	7-8	7-9	8-9
174													
1-2	1-3	1-8	1-9	2-3	2-6	3-4	4-5	4-7	5-6	5-9	6-7	7-8	8-9
175													
1-2	1-3	1-9	2-3	2-6	3-4	4-5	4-7	4-0	5-6	5-8	6-7	7-9	8-9
176													
1-2	1-3	1-9	2-3	2-5	2-6	3-4	4-5	4-7	5-8	6-7	6-9	7-8	8-9
177													
1-2	1-3	1-7	1-9	2-3	2-6	3-4	4-5	4-8	5-6	5-9	6-7	7-8	8-9
178													
1-2	1-4	1-7	1-9	2-3	2-5	3-4	3-8	4-5	5-6	6-7	6-9	7-8	8-9
179													
1-2	1-4	1-9	2-3	2-5	2-6	3-4	3-7	4-5	5-8	6-7	6-9	7-0	8-9
180													

1-2 1-4 1-7 1-9 2-3 2-6 3-4 3-8 4-5 5-6 5-9 6-7 7-8 8-9

CATALOG22 (4 Entries)

1						
1-2	1-3	1-4	q-3	2-4	3-4	3-4
1-2	1-2	1-4	2-3	3-4	3-4	3-4
3						
1-2	1-2	1-4	2-3	2-4	3-4	3-4
4						
1-2	1-2	1-4	1-4	2-3	3-4	3-4

CATALOG42 (34 Entries)

1	1-2	1-4	1-6	2-3	2-5	3-4	3-6	4-5	5-6	5-6
2	1-2	1-3	1-4	1-6	2-3	2-4	3-4	4-5	5-6	5-6
3	1-2	1-4	1-6	2-3	2-6	3-4	3-5	4-5	5-6	5-6
4	1-2	1-3	1-6	2-3	2-4	3-5	4-5	4-6	5-6	5-6
5	1-2	1-4	1-6	2-3	2-4	3-4	3-5	4-6	5-6	5-6
6	1-2	1-3	1-6	2-3	2-4	3-4	4-5	4-6	5-6	5-6
7	1-2	1-4	1-6	2-3	2-4	3-4	3-4	4-5	5-6	5-6
8	1-3	1-5	1-6	2-3	2-5	2-6	3-4	4-5	4-6	5-6
9	1-2	1-3	1-6	2-3	2-6	3-4	3-5	4-5	4-6	5-6
10	1-2	1-3	1-6	2-5	2-6	3-4	3-5	4-5	4-6	5-6
11	1-2	1-3	1-4	2-3	2-3	3-4	4-5	4-6	5-6	5-6
12	1-2	1-5	1-4	2-3	2-4	3-4	3-4	4-5	5-6	5-6
13	1-2	1-3	1-6	2-3	2-3	3-4	4-5	4-6	5-6	5-6
14	1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-6	5-6	5-6
15	1-2	1-3	1-6	2-3	2-4	3-4	3-4	4-5	5-6	5-6
16	1-2	1-3	1-6	2-3	2-3	2-4	3-4	4-5	5-6	5-6
17	1-2	1-3	1-6	2-3	2-4	3-4	4-5	4-5	5-6	5-6
18	1-2	1-2	1-6	2-3	2-4	3-4	3-5	4-5	5-6	5-6
19	1-2	1-2	1-4	2-3	2-6	3-4	3-5	4-6	5-6	5-6
20	1-2	1-2	1-6	2-3	2-4	3-4	3-6	4-5	5-6	5-6
21	1-2	1-2	1-4	2-3	2-6	3-4	3-6	4-5	5-6	5-6
22	1-2	1-3	1-6	2-3	2-4	3-4	4-5	5-6	5-6	5-6
23	1-2	1-6	1-6	2-3	2-3	3-4	4-5	4-5	5-6	5-6
24										

1-4	1-6	1-6	2-3	2-3	3-4	3-4	4-5	5-6	5-6
25 1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-6	5-6	5-6
26 1-2	1-2	1-3	2-4	3-4	3-4	3-6	4-5	5-6	5-6
27 1-2	1-2	1-4	2-3	2-6	3-4	3-4	4-5	5-6	5-6
28 1-2	1-2	1-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
29 1-2	1-2	1-6	2-3	3-4	3-4	3-6	4-5	5-6	5-6
30 1-2	1-2	1-6	2-3	3-4	3-6	4-5	4-5	5-6	5-6
31 1-2	1-3	1-6	2-3	2-3	3-4	4-5	4-5	5-6	5-6
32 1-2	1-2	1-6	2-3	2-6	3-4	3-4	4-5	5-6	5-6
33 1-2	1-4	1-6	2-3	2-3	2-3	3-4	4-5	5-6	5-6
34 1-2	1-2	1-2	1-6	2-3	3-4	3-4	4-5	5-6	5-6

CATALOG62 (297 Entries)

1
1-2 1-3 1-8 2-3 2-4 3-5 4-5 4-5 4-7 5-6 6-7 6-8 7-8
2
1-2 1-3 1-8 2-3 2-4 3-4 4-5 4-5 5-6 5-7 6-7 6-8 7-8
3
1-2 1-3 1-8 2-3 2-4 3-5 4-5 4-7 5-6 5-7 6-7 6-8 7-8
4
1-2 1-3 1-8 2-3 2-5 3-4 4-5 4-6 5-7 6-7 6-7 6-8 7-8
3
1-2 1-3 1-8 2-3 2-4 3-4 4-5 4-7 5-6 5-7 6-7 6-8 7-8
6
1-2 1-4 1-8 2-3 2-4 3-4 3-6 4-5 5-6 5-7 6-7 6-8 7-8
7
1-2 1-4 1-8 2-3 2-4 3-4 3-5 4-7 5-6 5-7 6-7 6-8 7-8
8
1-2 1-3 1-8 2-5 2-8 3-4 3-5 4-5 4-7 5-6 6-7 6-8 7-8
9
1-2 1-4 1-8 2-3 2-8 3-4 3-5 4-5 5-6 5-7 6-7 6-8 7-8
10
1-2 1-4 1-8 2-3 2-8 3-4 3-5 4-7 5-6 5-7 6-7 6-8 7-8
11
1-2 1-5 1-8 2-3 2-4 3-4 3-6 4-5 5-6 5-7 6-7 6-8 7-8
12
1-2 1-5 1-8 2-3 2-4 3-4 3-6 4-3 5-7 6-7 6-7 6-8 7-8
13
1-2 1-3 1-4 2-3 2-5 3-4 4-5 4-8 5-6 5-7 6-7 6-8 7-8
14
1-2 1-3 1-4 2-3 2-6 3-4 4-5 4-8 5-6 5-7 6-7 6-8 7-8
15
1-2 1-5 1-8 2-3 2-5 3-4 3-8 4-5 4-7 5-6 6-7 6-8 7-8
16
1-2 1-3 1-8 2-3 2-5 3-4 4-5 4-8 5-6 5-7 6-7 6-8 7-8
17
1-2 1-5 1-8 2-3 2-8 3-4 3-7 4-5 4-7 5-6 6-7 6-8 7-8
18
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1-2	1-2	1-8	2-3	3-4	3-8	4-5	4-5	4-6	5-6	6-7	7-8	7-8
164												
1-2	1-2	1-8	2-3	3-6	3-8	4-5	4-5	4-6	5-6	6-7	7-8	7-8
165												
1-2	1-2	1-8	2-3	3-4	3-b	3-8	4-5	4-5	5-6	6-7	7-8	7-8
166												
1-2	1-2	1-8	2-3	3-4	5-8	4-5	4-6	5-6	5-6	6-7	7-8	7-8
167												
1-2	1-2	1-8	2-3	3-4	3-8	4-5	4-R	5-6	5-b	6-7	7-8	7-8
168												
L-2	1-2	1-3	i-8	2-3	3-4	4-5	4-b	5-6	5-6	6-7	7-8	7-8
169												
1i-3	1-5	1-8	2-3	2-4	2-5	3-4	3-6	4-5	5-6	6-7	7-8	7-8
170												
1-3	1-5	1-8	2-3	2-4	2-5	3-b	4-5	4-6	5-6	6-7	7-8	7-8
171												
1-2	1-3	1-8	2-5	2-6	3-4	3-5	4-5	4-6	5-6	6-7	7-8	7-8
172												
t-2	1-3	i-5	2-3	2-4	3-b	3-8	4-5	4-6	5-6	6-7	7-8	7-8
173												
1-2	1-3	1-6	2-3	2-5	3-4	3-8	4-5	4-6	5-6	6-7	7-8	7-8
174												
1-2	1-4	1-S	2-3	2-8	3-4	3-b	4-5	5-6	5-8	b-7	7-8	7-8
175												
1-4	1-5	1-8	2-3	2-4	2-8	3-4	3-6	4-5	5-6	6-f	7-8	7-8
176												
1-2	1-6	1-8	2-3	2-5	3-4	3-8	4-5	4-6	5-6	6-7	7-8	7-8
177												
1-2	1-3	1-8	2-3	2-5	3-4	4-5	4-6	5-6	6-7	6-8	7-8	7-8
178												
1-2	1-3	1-8	2-3	2-4	3-6	4-5	4-6	5-6	5-8	6-7	7-8	7-8
179												
1-2	1-5	1-8	2-3	2-4	3-4	3-5	4-6	5-6	5-6	6-7	7-8	7-8
180												

1-2	1-3	1-6	2-3	2-5	3-4	4-5	4-7	5-6	b-7	6-8	7-8	7-8
181												
1-2	1-3	1-3	2-3	2-4	3-b	4-5	4-6	5-6	5-8	6-7	7-8	7-8
182												
1-2	1-4	1-8	2-3	2-4	3-4	3-b	4-5	5-6	5-8	6-7	7-8	7-8
183												
1-2	1-b	1-8	2-3	2-5	3-4	3-5	4-9	4-6	5-6	6-7	7-8	7-8
284												
b-2	1-3	1-8	2-3	2-4	3-4	3-6	4-5	5-6	5-8	b-7	7-8	7-8
185												
1-2	1-6	1-8	2-3	2-4	3-4	3-5	4-5	4-7	5-b	6-7	7-8	7-8
186												
1-2	1-3	1-5	2-3	2-4	3-4	3-6	4-5	5-6	5-8	6-7	7-8	7-8
187												
1-2	1-5	1-8	2-3	2-4	3-4	3-4	3-6	4-5	5-b	6-7	7-8	7-8
188												
1-2	1-5	1-8	2-3	2-5	3-4	3-4	4-6	5-6	5-6	6-7	7-8	7-Q
189												
1-2	1-b	1-8	2-3	2-5	3-4	3-4	4-3	4-7	5-6	6-7	7-8	7-8
190												
1-2	1-4	1-8	2-3	2-3	3-6	4-5	4-6	5-b	5-8	6-7	7-8	7-8
191												
1-2	1-4	1-8	2-3	2-3	3-4	3-6	4-3	5-6	5-8	b-7	7-8	7-8
192												
1-2	1-5	1-8	2-3	2-3	3-4	4-5	4-7	5-6	6-7	b-8	7-8	7-8
193												
1-2	1-4	1-5	1-8	2-3	2-3	3-6	4-5	4-6	5-6	6-7	7-8	7-8
194												
1-2	1-4	1-8	2-3	2-3	3-b	4-5	4-3	4-6	5-b	b-7	7-8	7-8
195												
1-2	1-2	1-3	2-b	3-4	3-6	3-8	4-5	4-5	5-b	b-7	7-8	7-8
196												
1-2	1-2	1-4	2-3	3-4	3-b	4-5	4-8	5-6	5-b	6-7	7-8	7-8
197												
1-2	1-5	1-8	2-3	2-3	3-4	4-5	4-7	5-6	5-6	6-7	7-8	7-8
190												
1-2	1-4	1-8	2-3	2-3	3-4	3-b	4-5	4-5	5-6	6-7	7-8	7-8
199												
1-2	1-4	1-8	2-3	2-3	3-4	3-b	4-t)	5-6	5-6	6-7	7-8	7-8
200												
5-2	1-2	1-8	2-3	3-4	5-6	4-5	4-5	4-8	5-6	b-7	7-8	7-8
201												
1-2	1-2	1-8	2-3	3-4	3-b	4-5	4-8	5-6	5-6	6-7	7-8	7-8
202												
1-2	1-2	1-8	2-3	3-4	3-7	4-5	4-8	5-b	5-6	b-7	7-8	7-8
203												
1-2	1-2	1-4	1-8	2-3	3-4	3-b	4-5	5-6	5-6	6-7	7-8	7-8
204												
1-2	1-5	1-8	2-3	2-3	3-4	4-5	4-6	4-b	5-b	b-7	7-8	7-8
205												
1-2	1-5	1-8	2-3	2-3	3-4	3-7	4-5	4-6	5-6	6-7	7-8	7-8
206												

1-2 207	1-2	1-8	2-6	3. 4	3-5	3-b	4-5	4-8	5-6	6-7	7-8	7-8
1-2 208	1-2	1-8	2-3	2-6	3-4	3-5	4-5	4-8	5-6	6-7	7-8	7-8
1-2 209	1-6	1-8	2-3	2-4	3-4	3-5	4-5	5-6	5-8	6-7	7-8	7-8
1-2 210	1-6	1-8	2-3	2. 4	3-4	3-b	4-5	5-6	5-8	b-7	7-8	7-8
4_i :	1-5	1-8	2-3	2-6	3-4	3-4	3-5	4-5	5-6	6-7	7-8	7-8
4_i :	1-6	1-8	2-3	2-7	3-4	3-6	4-5	4-5	5-6	6-7	7-8	7-8
1-2 213	1-5	1-8	2-3	2-7	3-4	3-b	4-5	4-5	5-6	6-7	7-8	7-8
1-2 214	1-5	1-7	2-3	2-6	3-4	3-4	4-5	5-6	5-8	6-7	7-8	7-8
1-2 215	1-5	1-8	2-3	2-7	3-4	3-4	3-6	4-5	5-b	6-7	7-8	7-8
1-2 216	1-6	1-8	2-3	2-5	3-4	3-4	4-5	4-8	5-b	b-7	7-8	7-8
1-2 217	1-3	1-6	2-3	2-4	3-4	4-5	5-6	5-6	5-8	6-7	7-8	7-8
1-2 218	1-7	1-8	2-3	2. 4	3-4	3-5	4-5	5-6	b-t	6-8	7-8	7-8
1-2 219	1-4	1-b	2-3	2-4	3-4	3-5	4-3	5-6	b-7	6-8	7-8	7-8
1-2 220	1-6	1-8	2-3	2-4	3-4	3-4	3-5	4-5	5-6	6-7	7-8	7-8
1-2 221	1-4	1. 8	2-3	2-4	3-4	3-5	4-3	5-6	6-7	6-8	7-8	7-8
1-2 222	1-3	1-8	2-3	2-5	3-4	4-3	4-6	5-6	6-7	7-8	7-8	7-8
1-2 223	1-5	1-6	2-3	2-4	3-4	3-5	4-5	5-b	b-7	6-8	7-8	7-8
1-2 224	1-4	1-6	2-3	2-5	3-4	3-5	4-5	5-6	b-7	6-8	7-8	7-8
1-4 225	1-6	1-8	2-3	2-4	2-5	3-4	3-5	4-5	5-6	6-7	7-8	7-8
1-2 226	1-7	1-8	2-3	2-6	3-4	3-5	4-5	4-6	5-b	6-7	7-8	7-8
1-2 227	1-7	1-8	2-3	2-5	3-4	3-b	4-5	4-6	5-b	6-7	7-8	7-8
1-2 228	1-5	1-8	2-3	2-4	3-4	3-5	4-5	5-6	b-7	6-8	7-8	7-8
1-2 229	1-4	1-8	2-3	2-5	3-4	3-5	4-j	5-b	b-7	b-8	7-8	7-8
1-2 230	1-5	1-8	2-3	2-4	3-4	3-b	4-5	5-6	b-7	7-8	7-8	7-8
1-2 231	1-4	1-b	2-3	2-5	3-4	3-4	4-3	5-6	b-7	6-8	7-8	7-8
i-4 232	1-b	1-8	2-3	2-3	2-5	3-4	4-5	4-5	5-6	6-7	7-8	7-8

1-2	1-4	1-8	2-3	2-5	3-4	3-4	4-5	5-6	6-7	6-8	7-8	7-8
233												
1-2	1-5	1-8	2-3	2-6	3-4	3-4	4-3	5-6	6-7	7-8	7-8	7-8
234												
1-2	1-3	1-5	2-3	2-4	3-4	4-5	5-6	5-6	b-7	6-8	7-8	7-8
235												
1-2	1-3	1-5	2-3	2-4	3-4	4-5	5-6	5-8	6-7	6-8	7-8	7-8
236												
1-2	1-6	1-8	2-3	2-4	3-4	3-5	4-5	5-6	b-7	7-8	7-8	7-8
237												
1-2	1-4	1-5	2-3	2-3	3-4	4-5	5-6	5-6	6-7	6-8	7-8	7-8
238												
1-2	1-5	1-b	2-3	2-4	3-4	3-4	4-3	5-6	b-t	6-8	7-8	7-8
239												
1-4	1-5	1-b	2-3	2-3	2-4	3-4	4-5	5-6	6-7	6-8	7-8	7-8
240												
1-2	1-7	1-8	2-3	2-6	3-4	3-5	4-g	4-5	5-6	6-7	7-8	7-8
241												
a-2	1-4	1-5	2-3	2-3	3-4	4-5	5-6	5-8	6-7	6-8	7-8	7-8
242												
1-2	1-5	1-8	2-3	2-4	3-4	3-4	4-5	5-6	6-7	6-8	7-8	7-8
243												
1-2	1-6	1-8	2-3	2-5	3-4	3-4	4-5	5-6	6-7	7-8	7-8	7-8
244												
1-2	1-3	1-4	2-3	2-4	3-4	3-8	4-5	5-6	5-7	b-7	6-8	7-8
245												
1-6	1-8	1-8	2-3	2-3	2-8	3-4	4-5	4-5	5-6	6-7	6-7	7-8
246												
1-2	1-2	1-b	2-8	3-4	3-8	3-8	4-5	4-5	5-6	6-7	6-7	7-8
247												
1-2	1-2	1-5	2-8	3-4	3-8	3-8	4-5	4-5	5-6	b-7	6-7	7-8
248												
1-2	1-2	1-5	2-8	3-4	3-4	3-8	3-8	4-5	5-6	6-7	6-7	7-8
249												
1-2	1-2	1-6	2-8	3-4	3-4	3-8	4-5	4-5	5-6	6-7	7-8	7-8
250												
S-6	1-8	1-8	2-3	2-4	2-8	3-4	3-5	4-5	5-6	6-7	6-7	7-8
251												
1-6	1-8	1-8	2-3	2-5	2-8	3-4	3-4	4-5	5-6	b-7	b-7	7-8
252												
1-2	1-2	1-6	2-8	3-4	3-5	3-8	4-5	4-5	5-6	b-7	b-7	7-8
253												
1-2	1-2	1-6	2-8	3-4	3-5	3-8	4-5	4-5	5-b	b-7	7-8	7-8
254												
1-2	1-2	1-6	2-8	3-4	3-4	3-5	4-5	5-6	5-8	6-7	7-8	7-8
255												
1-2	1-2	1-5	2-8	3-4	3-4	3-4	3-c)	4-5	5-6	6-7	6-7	7-8
256												
1-2	1-7	1-7	2-3	2-8	3-4	3-4	4-5	5-6	5-b	5-8	b-7	7-8
257												
1-2	1-7	1-7	2-3	2-8	3-4	3-4	4-5	4-8	5-6	5-b	b-7	7-8
258												

1-5	1-8	1-8	2-3	2-7	2-8	3-4	3-8	4-5	5-6	5-6	6-7	7-8
259												
1-5	1-8	1-8	2-3	2-7	2-8	3-4	3-8	4-5	5-6	6-7	6-7	7-8
260												
1-2	1-4	1-8	2-3	2-5	3-4	3-8	4-5	5-6	5-6	6-7	7-8	7-8
261												
1-2	1-4	1-8	2-3	2-5	3-4	3-8	4-5	5-6	6-7	6-7	7-8	7-8
262												
1-2	1-3	1-8	2-4	2-5	3-4	3-8	4-5	4-6	5-6	6-7	7-8	7-8
263												
1-2	1-3	1-8	2-4	2-6	3-4	3-6	4-5	5-6	5-7	6-7	7-8	7-8
264												
1-3	1-5	1-0	2-3	2-5	2-8	3-4	4-f)	4-6	5-6	6-7	7-8	7-8
265												
1-2	1-4	1-8	2-3	2-6	3-4	3-8	4-5	5-6	5-7	6-7	7-8	7-8
266												
1-2	1-5	1-8	2-3	2-3	3-4	3-6	4-5	4-7	5-6	6-7	7-8	7-8
267												
1-2	1-2	1-8	2-3	3-4	5-6	4-5	4-7	5-6	5-8	6-7	7-8	7-8
268												
1-2	1-2	1-8	2-3	2-5	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-8
269												
1-2	1-4	1-8	2-3	2-5	3-4	3-6	4-b	4-5	5-6	6-7	7-8	7-8
270												
1-3	1-5	1-8	2-3	2-5	2-6	3-4	4-3	4-6	5-6	6-7	7-8	7-8
271												
1-2	1-3	1-8	2-5	2-6	3-4	3-6	4-5	4-7	5-6	6-7	7-8	7-8
272												
t-4	1-5	1-8	2-3	2-5	2-8	3-4	3-6	4-5	5-6	6-7	7-8	7-8
273												
1-2	1-4	1-8	2-5	2-5	3-4	3-6	3-8	4-5	5-6	6-7	7-8	7-8
274												
1-2	1-5	1-8	2-3	2-6	3-4	3-8	4-5	4-6	5-6	6-7	7-8	7-8
275												
1-2	1-5	1-8	2-3	2-6	3-4	3-8	4-5	4-7	5-6	6-7	7-8	7-8
276												
If-2	1-3	1-8	2-3	2-6	3-4	4-5	4-7	5-6	5-8	6-7	7-8	7-8
277												
1-2	1-5	1-8	2-3	2-6	3-4	3-4	4-5	4-7	5-6	6-7	7-8	7-8
278												
1-2	1-5	1-8	2-3	2-3	3-4	3-6	4-3	4-8	5-6	6-7	7-8	7-8
279												
1-2	1-3	1-5	2-4	2-6	3-4	3-6	3-8	4-5	5-6	6-7	7-8	7-8
280												
1-2	1-4	1-6	2-3	2-5	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-8
281												
1-2	1-6	1-8	2-3	2-5	3-4	3-6	4-5	4-8	5-6	6-7	7-8	7-8
282												
1-2	1-6	1-8	2-3	2-5	3-4	3-7	4-5	4-8	5-6	6-7	7-8	7-8
283												
1-2	1-4	1-8	2-3	2-5	3-4	3-6	4-5	5-6	6-7	6-8	7-8	7-8
284												

1-2	1-4	1-8	2-3	2-5	3-4	3-7	4-5	5-6	6-7	6-8	7-8	7-8
285												
1-2	1-4	1-8	2-3	2-5	3-4	3-6	4-5	5-6	6-7	7-8	7-8	7-8
286												
1-2	1-4	1-8	2-3	2-5	3-4	3-8	4-5	5-6	5-7	6-7	6-8	7-8
287												
1-2	1-3	1-8	2-4	2-5	3-4	3-5	4-5	4-7	5-6	6-7	6-8	7-8
280												
1-2	1-3	1-8	2-4	2-5	3-4	3-5	4-7	5-6	5-7	6-7	6-8	7-8
209												
1-3	1-5	1-8	2-3	2-5	2-8	3-4	4-5	4-7	5-6	6-7	6-8	7-8
290												
1-2	1-3	1-8	2-3	2-5	3-4	4-6	4-7	5-6	5-7	6-7	6-8	7-8
291												
1-2	1-4	1-8	2-3	2-4	3-5	3-7	4-5	4-7	5-6	6-7	6-8	7-8
292												
1-2	1-4	1-8	2-3	2-8	S-5	3-7	4-j	4-7	5-6	6-7	6-8	7-8
293												
1-2	1-3	1-8	2-4	2-5	3-5	3-7	4-5	4-7	5-6	6-7	6-8	7-8
294												
1-2	1-5	1-8	2-3	2-6	3-4	3-8	4-5	4-7	5-6	6-7	6-8	7-8
295												
1-2	1-4	1-8	2-3	2-5	3-7	3-8	4-5	4-7	5-6	6-7	6-8	7-8
296												
1-3	1-6	1-8	2-3	2-6	2-8	3-4	4-3	4-7	5-6	5-8	6-7	7-8
297												
1-3	1-4	1-8	2-3	2-4	2-6	3-7	4-3	4-7	5-6	5-8	6-7	7-8

CATALOG23 (1 Entry)

1-2 1-2 1-3 1-3 2-3 2 3

CATALOG23 (12 Entries)

1	1-2	1-2	1-3	2-3	3-4	3-5	4-5	4-5	4-5
2	1-2	1-2	1-3	1-5	2-3	3-4	4-5	4-5	4-5
3	1-2	1-2	1-3	1-5	2-3	2-3	3-4	4-5	4-5
4	1-2	1-2	1-5	2-3	2-3	3-4	4-5	4-5	4-5
5	1-2	1-2	1-5	2-3	2-4	3-4	3-4	3-5	4-5
6	1-2	1-3	1-4	1-5	2-3	2-3	2-4	3-5	4-5
7	1-2	1-3	1-4	1-5	2-3	2-4	2-5	3-4	4-5
8	1-2	1-2	1-4	1-5	2-3	2-3	3-4	3-5	4-5
9	1-2	1-2	1-5	2-3	2-3	3-4	3-4	4-5	4-5
10	1-2	1-2	1-3	1-5	2-3	2-4	3-4	4-5	4-5
11	1-2	1-2	1-3	1-4	2-3	3-4	3-5	4-5	4-5
12	1-2	1-2	1-3	1-5	2-3	3-4	3-4	4-5	4-5

CATALOG43 (186 Entries)

1	1-2	1-3	1-7	2-3	2-3	2-4	3-4	4-5	4-6	5-6	5-7	6-7
2	1-2	1-3	1-7	2-3	2-4	2-5	3-4	4-5	4-6	5-6	5-7	6-7
3	1-2	1-3	1-7	2-3	2-3	2-4	3-5	4-5	4-6	4-7	5-6	6-7
4	1-2	1-3	1-6	1-7	2-3	2-5	3-4	4-5	4-5	4-6	5-7	6-7
5	1-2	1-3	1-6	1-7	2-3	2-4	3-4	4-5	4-5	5-6	5-7	6-7
6	1-2	1-3	1-6	1-7	2-3	2-4	2-5	3-4	4-5	4-6	5-7	6-7
7	1-2	1-3	1-6	1-7	2-3	2-4	3-5	4-5	4-5	4-7	5-6	6-7
8	1-2	1-3	1-6	1-7	2-3	2-4	2-5	3-4	4-5	5-6	5-7	6-7
9	1-2	1-3	1-6	1-7	2-3	2-4	3-4	3-6	4-5	5-6	5-7	6-7
10	1-2	1-2	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	5-7	6-7
11	1-2	1-3	1-4	2-3	2-3	2-4	3-6	4-5	4-7	5-6	5-7	6-7
12	1-2	1-3	1-4	1-7	2-3	2-4	3-4	3-6	4-5	5-6	5-7	6-7
13	1-2	1-3	1-4	1-7	2-5	2-3	2-4	3-6	4-5	5-6	5-7	6-7
14	1-2	1-2	1-6	2-3	3-4	3-5	3-7	4-5	4-6	4-7	5-6	6-7
15	1-2	1-3	1-7	2-3	2-3	2-4	3-6	4-5	4-7	5-6	5-7	6-7
16	1-2	1-3	1-6	1-7	2-3	2-5	2-6	3-4	4-5	4-7	5-6	6-7
17	1-2	1-3	1-7	2-3	2-6	3-4	4-5	4-5	4-7	5-6	5-6	6-7
18	1-2	1-3	1-7	2-3	2-5	2-6	3-4	4-5	4-5	4-7	5-6	6-7
19	1-2	1-3	1-4	1-7	2-3	2-6	3-4	4-5	4-5	5-6	5-7	6-7
20	1-2	1-2	1-3	1-3	2-5	2-6	3-4	3-7	4-5	4-7	5-6	6-7
21	1-2	1-2	1-7	1-7	2-3	2-3	3-4	3-4	4-5	5-6	5-6	6-7
22	1-2	1-2	1-7	1-7	2-3	2-3	3-4	4-5	4-5	5-6	5-6	6-7
23	1-2	1-2	1-6	1-7	2-3	2-3	3-4	3-4	4-5	5-6	5-7	6-7
24												

1-2	1-2	1-6	1-7	2-3	2-3	3-4	4-5	4-5	5-6	5-7	6-7
25											
1-2	1-2	1-7	2-3	2-3	3-4	3-4	4-5	5-6	5-6	5-7	6-7
26											
1-2	1-2	1-5	2-3	2-3	3-4	3-4	4-5	5-6	5-7	6-7	6-7
27											
1-2	1-2	1-6	1-7	2-3	3-4	3-4	4-5	4-5	5-6	6-7	6-7
28											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	4-5	4-5	5-6	6-7	6-7
29											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	3-4	4-5	5-6	6-7	6-7
30											
1-2	1-2	1-6	1-7	2-3	2-3	3-4	4-5	4-5	5-6	6-7	6-7
31											
1-2	1-2	1-7	2-3	2-3	3-4	4-5	4-5	5-6	6-7	6-7	6-7
32											
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33											
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34											
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35											
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36											
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37											
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38											
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39											
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40											
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41											
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42											
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43											
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44											
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45											
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46											
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47											
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48											
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49											
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50											

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51											
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52											
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53											
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54											
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55											
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56											
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57											
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'50											
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59											
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60											
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61											
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62											
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63											
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64											
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65											
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66											
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67											
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68											
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69											
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70											
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71											
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72											
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73											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	4-5	5-6	6-7	6-7	6-7
74											
1-P	1-2	1-7	2-3	2-4	3-4	3-4	3-5	4-6	5-6	5-7	6-7
75											
1-2	1-2	1-6	1-7	2-3	3-4	3-5	4-5	4-5	4-6	5-7	6-7
76											

1-2	1-2	1-6	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	6-7
77											
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78											
1-2	1-2	1-4	1-7	2-3	2-4	3-4	3-5	4-5	5-6	6-7	6-7
79											
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80											
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81											
1-2	1-2	1-4	1-7	2-3	3-4	3-6	4-5	5-6	5-6	5-7	6-7
82											
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83											
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84											
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85											
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86											
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87											
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88											
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89											
1-2	1-2	1-7	2-3	2-4	3-4	3-6	4-5	5-6	5-7	6-7	6-7
90											
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91											
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92											
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93											
1-2	1-2	1-5	2-3	2-4	3-4	3-6	3-7	4-5	5-6	5-7	6-7
94											
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95											
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96											
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97											
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98											
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99											
1-2	1-2	1-7	2-3	2-4	3-4	3-6	3-7	4-5	4-7	5-6	5-6
100											
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101											
1-2	1-2	1-4	1-6	2-3	3-4	3-5	4-5	4-7	5-6	6-7	6-7
102											

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103											
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104											
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105											
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106											
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107											
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108											
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109											
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110											
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111											
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112											
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113											
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114											
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115											
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116											
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117											
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118											
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119											
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121											
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122											
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123											
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124											
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125											
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126											
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132											
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133											
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134											
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135											
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136											
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137											
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138											
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139											
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140											
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141											
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142											
1-2	1-2	1-7	2-3	3-4	3-4	3-5	4-7	4-7	5-6	5-6	6-7
143											
1-2	1-2	1-5	2-3	3-4	3-4	3-6	4-5	5-6	5-7	6-7	6-7
144											
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145											
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146											
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147											
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148											
1-2	1-2	1-7	2-3	2-6	3-4	3-5	3-7	4-5	4-5	5-6	6-7
149											
1-2	1-2	1-4	2-3	2-7	3-4	3-6	4-5	4-7	5-6	5-6	6-7
150											
1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-6	5-6	5-6	5-7	6-7
151											
1-2	1-2	1-2	1-7	2-3	3-4	3-5	4-5	4-6	4-7	5-6	6-7
152											
1-2	1-2	1-3	2-3	3-4	3-5	4-5	4-6	4-7	5-6	5-7	6-7
153											
1-2	1-2	1-7	2-3	2-7	3-4	3-5	3-6	4-5	4-6	4-7	5-6
154											

1-2	1-2	1-2	1-7	2-3	3-4	3-5	3-7	4-5	4-6	5-6	6-7
155											
1-2	1-2	1-2	1-7	2-3	3-4	3-5	3-6	4-5	4-7	5-6	6-7
156											
1-2	1-2	1-3	2-3	3-4	3-5	4-5	4-5	4-7	5-6	6-7	6-7
157											
1-2	1-2	1-3	1-5	2-3	3-4	4-5	4-5	4-7	5-6	6-7	6-7
158											
1-2	1-2	1-2	1-7	2-3	3-4	3-6	4-5	4-5	4-7	5-6	6-7
159											
1-2	1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-6	5-6	5-7	6-7
160											
1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-7	5-6	5-6	5-7	6-7
161											
1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-5	5-6	5-7	6-7	6-7
162											
1-2	1-2	1-7	2-3	2-7	3-4	3-6	3-7	4-5	4-5	4-6	5-6
163											
1-2	1-2	1-2	1-3	2-3	3-4	3-7	4-5	4-7	5-6	5-6	6-7
164											
1-2	1-f	1-2	1-7	2-3	3-4	3-7	4-5	4-5	4-b	5-6	6-7
165											
1-2	1-2	1-2	1-7	2-3	3-4	3-7	4-5	4-6	4-7	5-6	5-6
166											
1-2	1-2	1-5	1-7	2-3	2-3	3-4	3-6	4-5	4-7	5-6	6-7
167											
1-2	1-2	1-7	2-3	2-4	3-4	3-5	3-6	4-5	4-6	5-7	6-7
168											
1-2	1-2	1-6	1-7	2-3	2-4	3-4	3-6	3-7	4-5	5-6	5-7
169											
1-2	1-2	1-4	1-7	2-3	2-5	3-4	3-6	4-5	5-6	6-7	6-7
170											
1-2	1-2	1-5	1-7	2-3	3-4	3-6	4-5	4-5	4-7	5-6	6-7
171											
1-2	1-2	1-4	1-4	2-3	3-4	3-5	3-7	4-5	4-7	5-6	6-7
172											
1-2	1-2	1-6	1-7	2-3	2-5	3-4	3-6	3-7	4-5	4-7	5-6
173											
1-2	1-2	1-5	1-7	2-3	2-5	3-4	3-6	4-5	4-7	5-6	6-7
174											
1-2	1-3	1-6	1-7	2-3	2-5	3-4	4-5	4-6	4-7	5-6	5-7
175											
1-2	1-3	1-6	1-7	2-3	2-4	2-5	3-4	4-6	4-7	5-6	5-7
176											
1-2	1-3	1-7	2-3	2-4	2-5	3-4	3-5	4-6	4-7	5-6	6-7
177											
1-2	1-3	1-5	1-7	2-3	2-5	2-6	3-4	4-5	4-6	5-7	6-7
178											
1-2	1-4	1-6	1-7	2-3	2-5	3-4	3-6	3-7	4-5	5-6	5-7
179											
1-2	1-6	1-7	1-7	2-3	2-3	3-4	3-7	4-5	4-5	5-6	5-6
180											

1-2	1-5	1-5	1-6	2-3	2-3	3-4	3-7	4-5	4-5	6-7	6-7
181											
1-2	1-6	1-7	1-7	2-3	2-3	3-4	3-7	4-5	4-5	4-6	5-6
182											
183	1-4	1-7	1-7	2-3	2-3	3-4	3-7	4-5	4-6	5-6	5-6
1-2	1-2	1-5	1-6	2-3	3-4	3-7	4-5	4-5	4-5	6-7	6-7
184											
1-2	1-4	1-6	2-3	2-7	2-7	3-4	3-4	4-5	5-6	5-6	6-7
185											
1-2	1-6	1-7	1-7	2-3	2-3	2-6	3-4	4-5	4-5	4-7	5-6
186											
1-2	1-6	1-7	1-7	2-3	2-3	2-6	3-4	4-5	4-7	5-6	5-6

CATALOG 4 (3 Entries)

1							
1-2	1-2	1-4	1-4	2-3	2-3	3-4	3-4
2							
1-2	1-2	1-2	1-4	2-3	3-4	3-4	3-4
3							
1-2	1-2	1-3	1-4	2-3	2-4	3-4	3-4

CATALOG24 (54 Entries)

1										
1-2	1-3	1-4	2-4	2-5	3-4	3-5	3-6	4-5	4-6	5-6
2										
1-2	1-4	1-6	2-3	2-5	3-4	3-4	3-6	4-5	5-6	5-6
3										
1-3	1-4	1-6	2-3	2-4	2-6	3-4	3-5	4-5	5-6	5-6
4										
1-2	1-3	1-6	2-3	2-6	3-4	3-5	4-5	4-5	4-6	5-6
5										
1-2	1-3	1-6	2-3	2-5	2-6	3-4	3-5	4-5	4-6	5-6
6										
1-2	1-3	1-6	2-3	2-4	3-5	3-6	4-5	4-5	4-6	5-6
7										
1-2	1-3	1-6	2-3	2-3	2-4	3-5	4-5	4-5	4-6	5-6
8										
1-2	1-3	1-3	1-6	2-3	2-4	3-5	4-5	4-5	4-6	5-6
9										
1-2	1-2	1-5	1-6	2-3	2-3	3-4	3-6	4-5	4-6	5-6
10										
1-2	1-5	1-6	2-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6
11										
1-2	1-5	1-6	2-3	2-4	3-4	3-6	3-6	4-5	4-5	5-6
12										
1-2	1-3	1-5	2-3	2-4	3-6	3-6	4-5	4-5	4-6	5-6
13										
1-2	1-3	1-5	2-3	2-5	3-4	3-4	4-6	4-6	5-6	5-6
14										
1-2	1-6	1-6	2-3	2-3	3-4	3-4	4-5	4-5	5-6	5-6
15										
1-2	1-2	1-6	2-3	3-4	3-4	3-6	4-5	4-5	5-6	5-6
16										
1-2	1-2	1-6	2-3	2-6	3-4	3-4	4-5	4-5	5-6	5-6
17										
1-2	1-2	1-2	1-6	2-3	3-4	3-4	4-5	4-5	5-6	5-6
18										
1-2	1-2	1-3	1-6	2-3	2-6	3-4	4-5	4-5	5-6	5-6
19										
1-2	1-2	1-3	1-6	2-3	2-6	3-4	3-4	4-5	5-6	5-6
20										
1-2	1-2	1-6	2-3	2-4	3-4	3-6	4-5	4-5	5-6	5-6
21										
1-2	1-2	1-3	2-3	2-4	3-4	3-6	4-5	4-5	5-6	5-6
22										
1-2	1-2	1-3	1-6	2-3	2-4	3-4	4-5	4-5	5-6	5-6
23										
1-2	1-2	1-3	1-4	2-3	2-3	3-4	4-5	4-5	5-6	5-6
24										

1-2 25	1-4	1-6	2-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
1-2 26	1-2	1-6	2-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
1-2 27	1-2	1-2	1-3	2-3	3-4	3-6	4-5	4-5	5-6	5-6
1-2 28	1-3	1-6	2-3	2-3	3-4	4-5	4-5	4-6	5-6	5-6
1-2 29	1-2	1-3	2-3	3-4	3-6	4-5	4-5	4-6	5-6	5-6
1-2 30	1-2	1-2	1-6	2-3	3-4	3-4	3-6	4-5	5-6	5-6
1-2 31	1-2	1-2	1-6	2-3	3-4	3-6	4-5	4-5	5-6	5-6
1-2 32	1-2	1-6	2-3	2-6	3-4	3-4	3-5	4-5	5-6	5-6
1-2 33	1-2	1-6	2-4	3-4	3-4	3-5	3-6	4-5	5-6	5-6
1-2 34	1-2	1-6	2-3	2-4	3-4	3-5	3-6	4-5	5-6	5-6
1-2 35	1-2	1-3	1-6	2-4	3-4	3-4	3-5	4-5	5-6	5-6
1-2 36	1-3	1-4	1-6	2-3	2-4	3-4	3-5	4-5	5-6	5-6
1-2 37	1-4	1-6	2-3	2-3	3-4	3-5	4-5	4-6	5-6	5-6
1-2 38	1-2	1-3	1-4	2-3	3-4	3-5	4-5	4-6	5-6	5-6
1-2 39	1-2	1-4	2-3	3-4	3-5	3-6	4-5	4-6	5-6	5-6
1-2 40	1-2	1-4	2-3	2-6	3-4	3-5	4-5	4-6	5-6	5-6
1-2	1-2	1-3	1-6	2-3	3-4	3-5	4-5	4-6	5-6	5-6
1-2 42	1-2	1-2	1-6	2-3	3-4	3-5	4-5	4-6	5-6	5-6
1-2 43	1-2	1-2	1-4	2-3	3-4	3-5	4-5	4-6	5-6	5-6
1-2 44	1-2	1-6	2-3	2-6	3-4	3-4	3-4	4-5	5-6	5-6
1-2 45	1-2	1-6	2-3	2-3	3-4	3-4	3-4	4-5	5-6	5-6
1-2 46	1-3	1-6	2-3	2-3	2-4	3-4	4-5	4-6	5-6	5-6
1-2 47	1-2	1-3	1-6	2-4	3-4	3-4	3-6	4-5	5-6	5-6
1-2 48	1-2	1-6	2-3	2-5	3-4	3-4	3-6	4-5	5-6	5-6
1-2 49	1-3	1-6	2-3	2-3	2-4	3-4	4-5	4-6	5-6	5-6
1-2 50	1-3	1-4	2-3	2-4	3-4	3-6	4-5	5-6	5-6	5-6

1-2	1-2	1-4	2-3	3-4	3-4	3-6	4-5	5-6	5-6	5-6
51										
1-2	1-3	1-4	2-3	2-3	3-4	4-5	4-6	5-6	5-6	5-6
52										
1-2	1-2	1-3	2-3	3-4	3-4	4-5	4-6	5-6	5-6	5-6
53										
1-2	1-4	1-6	2-3	2-3	2-3	3-4	4-5	5-6	5-6	5-6
54										
1-4	1-6	1-6	2-3	2-3	2-3	2-6	3-4	4-5	4-5	5-6

CATALOG#5 (6 Entries)

1										
1-2	1-2	1-2	1-5	2-3	3-4	3-4	3-5	4-5	4-5	
2										
1-2	1-2	1-5	1-5	2-3	2-3	3-4	3-4	4-5	4-5	
3										
1-2	1-2	1-5	1-5	2-3	2-5	3-4	3-4	4-5	4-5	
4										
1-2	1-3	1-4	1-5	2-3	2-3	2-4	3-5	4-5	4-5	
5										
1-2	1-3	1-4	1-5	2-3	2-4	2-5	3-4	3-5	4-5	
6										
1-2	1-2	1-2	1-5	2-5	3-4	3-4	3-4	3-5	4-5	